

associated with first stored tactile sensation information, wherein said first computer produces said first image and said haptic feedback signal based at least in part on information received from a second computer and based at least in part on said first computer input, and

said second computer coupled to said network and comprising a second visual display and a second interface device capable of providing a second computer input, said second interface device comprising an actuator capable of providing haptic feedback in response to a haptic feedback signal provided by said second computer, said second computer developing a second image in a second gaming environment on said second visual display substantially simultaneously with said development of said first image in said first gaming environment, said second image associated with second stored tactile sensation information, wherein said second computer produces said second image and said haptic feedback signal based on information received from said first computer and based on said second computer input.

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3. (amended) A system as recited in claim 2 wherein both said first computer and said second computer are network access computers which communicate over said network using TCP/IP protocols.

4. (amended) A system as recited in claim 3 wherein said first computer sends information to a Uniform Resource Locator of said second computer.

5. (amended) A system as recited in claim 2 wherein said first interface device includes a user manipulatable object for receiving input from said user, said user manipulatable object being movable in two degrees of freedom.

6. (amended) A system as recited in claim 5 wherein said first interface device includes a local controller that communicates with said first computer, a plurality of actuators for providing said tactile sensations, and at least one sensor for sensing positions of said user manipulatable object.

7. (amended) A system as recited in claim 5 wherein said user manipulatable object is receptive to a finger of said user for manipulating said user manipulatable object in said two degrees of freedom.

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concl. 8. (amended) A system as recited in claim 6 wherein said haptic feedback signal includes a haptic feedback command that can be parsed by said local controller such that said controller can control said actuators in response to said haptic feedback command in a control loop with said sensors.

Please cancel claim 9.

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DL 11. (amended) A system as recited in claim 12 wherein both said first computer means and said second computer means are network access computer means which communicate over said network using TCP/IP protocols.

C2 12. (amended) A system comprising:

first computer means coupled to a network means; and

a second computer means coupled to said network means, said second computer means comprising a visual display means, said visual display means comprises means for displaying a graphical environment, wherein said graphical environment comprises said visual information transferred from said first computer means to said second computer means, and human/computer interface means, wherein said human/computer interface means comprises an actuator means, said second computer means further comprising means for interpreting visual information and feel sensation information repeatedly received from said first computer means over said network means, updating said visual display means from said visual information, and causing said actuator to generate a physical feel sensation at said human/computer interface means using said feel sensation information.

13. (amended) A system as recited in claim 12 wherein said second computer means input comprises at least one of a position input for said human/computer interface device, and a button click input.

14. (amended) A system as recited in claim 12 wherein said human/computer interface means coupled to said second computer means includes a local controller means that communicates with said second computer means, a plurality of said actuator means for providing said physical feel sensations.

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15. (amended) A system as recited in claim 14 wherein said second computer means sends a force feedback command to said local controller means that can be parsed by said local controller means such that said controller means can control said actuator means in response to said force feedback command in a control loop with said sensor means.

Please cancel claim 16.

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17. (amended) A method for providing haptic feedback, comprising:  
receiving first computer information from a first computer at a second computer over a network, wherein said first computer information comprises information representing a position of a user manipulatable object.

generating an image to be displayed on a visual display of said second computer;

receiving input information at said second computer from a haptic feedback device; and

causing a tactile sensation signal to be provided to said haptic feedback device from said second computer, said tactile sensation signal being based on said first computer information and said input information, wherein said haptic feedback signal causes said haptic feedback device to output haptic feedback.

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19. (amended) A method as recited in claim 17 further comprising sending second computer information from said second computer to said first computer over said network.

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21. (amended) A method as recited in claim 17 wherein said image includes displaying a first graphical object controlled by a user of said first haptic feedback device, and displaying a second graphical object controlled by a user of said second haptic feedback device.

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24. (amended) A method as recited in claim 17 wherein said first haptic feedback device includes an object representing a body part to be physically contacted by a user.

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25. (amended) A method as recited in claim 17 wherein said second haptic feedback device includes a local controller that communicates with said second computer, wherein said local controller parses a haptic feedback command sent by said second computer such that said local haptic can control said actuator in response to said haptic feedback command in a control loop with at least one sensor of said second haptic feedback device.

Please cancel claim 26.

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27. A method for providing physical interaction over a computer network comprising:  
  
enabling first information to be transmitted comprising an indication of movement of a first manipulandum coupled to a first computer over said computer network to a second manipulandum coupled to a second computer;

causing a force to be applied to said second manipulandum based on said indication of movement of said first manipulandum;

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concl. enabling second information to be transmitted comprising an indication of said movement of said second manipulandum over said computer network to said first manipulandum; and

causing a force to be applied to said first manipulandum based on said indication of movement of said second manipulandum.

Please cancel ~~claim 35.~~

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C8 36. (amended) A method as recited in claim 38 wherein said first computer receives input information from said first haptic feedback device in response to manipulation of said first haptic feedback device by said first user, and wherein said second computer receives input information from said second haptic feedback device in response to manipulation of said second haptic feedback device by said second user.

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DI 38. (amended) A method for providing haptic feedback between a first computer and a second computer comprising:

sending first computer information to said second computer from said first computer over a network, wherein said first computer information comprises position information describing a position of a manipulandum of a first haptic feedback device;

causing a haptic feedback signal to be sent to a second haptic feedback device from said second computer, said haptic feedback signal being based on said first computer information, wherein said haptic feedback signal causes said second haptic feedback device to output a force;

sending second computer information to said first computer from said second computer over said network,

wherein said second computer information comprises position information describing a position of a manipulandum of a second haptic feedback device; and

causing a haptic feedback signal to be sent to said a haptic feedback device from said first computer, said haptic feedback signal being based on said second computer information, wherein said haptic feedback signal causes said first haptic feedback device to output a force.

41. (amended) A method as recited in claim 38 wherein said first and second computers communicate using a TCP/IP protocol.

42. A method as recited in claim 38 further comprising accessing a server computer with one of said first and second computers and downloading feel sensation information from said server computer, said feel sensation information to be included in said first computer information or said second computer information.

44. (amended) A system as recited in claim 2 wherein said first computer and said second computer communicate with at least one server over said network, wherein said information received from said first computer and said information received from said second computer are communicated via said server.

45. (amended) A system as recited in claim 2 wherein said image displayed in said second gaming environment includes a graphical object that can interact with a projectile.

46. (amended) A system as recited in claim 45 wherein said projectile includes a ball or puck.

47. (amended) A system as recited in claim 2 wherein said image displayed in said second gaming environment includes a graphical object having a location based on position information received from said second interface device, said graphical object able to collide with a different graphical object displayed in said second gaming

environment, said different graphical object having a location based at least in part on said information received from said first computer.

48. (amended) A system as recited in claim 2 wherein said image displayed in said second gaming environment includes a graphical object having a location based on position information received from said second interface device, said graphical object able to collide with an obstruction displayed in said second gaming environment.

49. (amended) A system as recited in claim 12, wherein said second computer means receives position information from said first computer means over said network, said position information describing a position of a user manipulatable object of human/computer interface means included in said first computer means.

50. (amended) A system as recited in claim 12, wherein said position information describes a position of a body part.

51. (amended) A method as recited in claim 17 wherein said first computer information includes information needed to update a simulated graphical object displayed by said second computer.

53. (amended) A method as recited in claim 17 wherein said first computer provides said first computer information to a server computer in communication with said network, and wherein said server computer provides information based on said first computer information to said second computer.

54. (amended) A method as recited in claim 17 wherein said first computer provides said first computer information to a server computer in communication with said network, and wherein said server computer performs processing on said first computer information before sending said first computer information to said second computer.

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55. (amended) A method as recited in claim 17 wherein said first computer and said second computer receive information from a server computer in communication with said network.

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Please cancel claim 57.

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58. (amended) A method for providing haptic feedback comprising:

receiving first computer information from a first computer at a server computer over a network;

providing said first computer information to a second computer, wherein said first computer information comprises information that updates a simulated graphical object in a graphical environment running on said second computer, and wherein said second computer uses said first computer information to update a game program running on said second computer, and wherein said second computer provides a second haptic feedback signal based at least in part on said first computer information to a second haptic feedback device;

receiving second computer information from said second computer at said server computer over said computer network; and

providing said second computer information to said first computer, wherein said second computer information comprises information that updates a simulated graphical object in a graphical environment running on said first computer, and wherein said first computer uses said second computer information to update a game program running on said first computer, and wherein said first computer provides a first haptic feedback signal based at least in part on said second computer information to a first haptic feedback device.



59. (amended) A method as recited in claim 58 wherein said first computer information includes force information describing a tactile sensation, wherein said tactile sensation is output by said second haptic feedback device.

60. (amended) A method as recited in claim 58 further comprising sending tactile sensation data stored on said server computer to said first computer.

61. (amended) A method as recited in claim 58 wherein said first computer information includes position data allowing said second computer to display a graphical object in said graphical environment running on said second computer.

62. (amended) A method as recited in claim 58 wherein said server computer runs a web page.

63. (amended) A method as recited in claim 58 wherein updating said game program running on said first computer includes updating a location of a displayed player graphical object based at least in part on said second computer information.

64. (amended) A method as recited in claim 58 wherein said updating of said game program running on said first computer includes updating a location of a projectile.

Please cancel claim 71.

72. (amended) A method as recited in claim 75 wherein said first computer is a client computer and said second computer is a server computer.

73. (amended) A method as recited in claim 75 wherein said first computer and said second computer are client computers.

74. (amended) A method as recited in claim 75 wherein said information received from said second computer includes web page information.

75. (amended) A method for providing haptic feedback over a computer network comprising:

receiving first information at a first computer from a second computer over a network, said information comprising haptic feedback information and position information for a graphical object displayed by said second computer;

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Cmcl. using said first information to repeatedly update a visual display running on said first computer, and wherein said first computer repeatedly provides a haptic feedback signal based at least in part on said haptic feedback information to a haptic feedback device, wherein said haptic feedback device outputs a tactile sensation based on said haptic feedback signal and correlated with said updated visual display; and

sending second information from said first computer to said second computer over said computer network.

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C15 78. (amended) A method as recited in claim 75 wherein said visual display is updated by moving a graphical object within a graphical game environment based on position data received from said haptic feedback device, where a collision between said graphical object and a different graphical object can be detected to cause said tactile sensation to be output.

79. (amended) A method as recited in claim 75 wherein said first computer receives an indication of a gaming event in said information, said first computer synchronizing said visual display associated with said gaming event with said tactile sensation that is associated with said gaming event.

Please cancel claim 83.

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84. (amended) A device as recited in claim 89 wherein said information has been received by said host computer from a server machine connected to said network.

85. (amended) A device as recited in claim 89 wherein said information has been received by said host computer from a client machine.

86. (amended) A device as recited in claim 84 wherein said server machine and said host computer communicate over said network using TCP/IP protocols.

87. (amended) A device as recited in claim 89 wherein said haptic feedback data includes at least one command, and wherein said local controller parses said command to control said actuator.

88. (amended) A device as recited in claim 89 further comprising a button input device having a state responsive to manipulation by said user, wherein said state of said button input device is provided to said local controller and from said local controller to said host computer.

89. (amended) A device comprising:

a network;

a first computer in communication with said network;

a user manipulatable object moveable in at least one degree of freedom and operable to control a position of a first graphical object displayed by said first computer in a graphical environment;

an actuator operative to output a tactile sensation;

at least one sensor operative to detect a position of said user manipulatable object in at least one degree of freedom, wherein position data describing said detected position is provided to said first computer; and

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a local controller, separate from and communicating with said first computer, and coupled to said actuator and said sensor, said local controller receiving haptic feedback data from said first computer, said haptic feedback data coordinating a tactile sensation to be output by said actuator with interaction between said first graphical object and a second graphical object displayed in a graphical environment by said host computer, wherein said haptic feedback data and a state of said displayed second graphical object are derived using said information received by said first computer from a second computer in communication with said network.

90. (amended) A device as recited in claim 84 wherein said user manipulatable object is constrained to move in two planar degrees of freedom, wherein said actuator is a first voice coil actuator, and further comprising a second voice coil actuator, wherein said cursor is controlled by said user manipulatable object to select said displayed element on said web page.

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92. (amended) A method as recited in claim 97 wherein said local model of said particular client computer also receives button data from said associated haptic feedback device, said button data describing a state of at least one button on said associated haptic feedback device.

93. (amended) A method as recited in claim 97 wherein said first graphical object is a representation of sporting equipment.

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95. (amended) A method as recited in claim 97 wherein said first graphical object includes a representation of a weapon.

96. (amended) A method as recited in claim 97 wherein each of said local models of said computer-gaming simulation of said multiple client computers displays a graphical object having a location influenced by position data received from an associated interface device in communication with each client computer.

97. (amended) A method comprising:

enabling the execution of a computer-gaming simulation on a plurality of client computers, each of said plurality of client computers in communication with the Internet, wherein each of said plurality of client computers substantially simultaneously executes a local model of said computer-gaming simulation and visually displays said computer-gaming simulation;

enabling at least one of said local models of said computer-gaming simulation to access a haptic feedback device connected to one of said plurality of client computers running said local model, wherein said haptic feedback device comprises a user manipulatable object, a movement of said user manipulatable object tracked by a sensor of said haptic feedback device, and wherein said local model receives position data from said haptic feedback device describing said movement and sends haptic feedback data to said haptic feedback device;

enabling a location of a first graphical object displayed in said local model of said computer-gaming simulation to get updated based on said position data;

enabling a location of a second graphical object displayed in said local model of said computer-gaming simulation to be updated based, at least in part, on information received over said Internet, said information at least partially comprising data originating from a different one of said plurality of client computers in communication with said Internet, wherein said information comprises a gaming event, said particular client

computer synchronizing a visual display of said computer-gaming simulation associated with said gaming event with a tactile sensation that is associated with said gaming event;

enabling said computer-game simulation of said particular client computer to determine if said first graphical object displayed on said client computer has collided with said second graphical object and determine a tactile sensation to generate if said collision has occurred; and

enabling said computer-game simulation to cause tactile data to be sent from said particular client computer to said haptic feedback device to output said tactile sensation.

98. (amended) A method as recited in claim 97 wherein a sound is associated with an event occurring in said computer-gaming simulation, wherein said computer synchronizes the output of said sound with said tactile sensation that is associated with said event.